Published in final edited form as:

Addict Behav. 2017 February ; 65: 19–24. doi:10.1016/j.addbeh.2016.09.010.

Beverage-Specific Patterns of 5+ Alcoholic Drink Consumption by Young Adults in the U.S

Stephanie A. Stern, BS^a, Yvonne M. Terry-McElrath, MSA^a, and Megan E. Patrick, Ph.D.^{a,*}

^aInstitute for Social Research, University of Michigan, 426 Thompson St., Ann Arbor, MI 48106-1248

Abstract

Young adult binge drinking prevalence has been widely researched. However, beverage-specific binge drinking rates for beer, liquor, wine, and wine coolers have not yet been documented for this age group. This study examines consumption of specific beverages (i.e., 5+ drinks in a row in the past two weeks) by young adults aged 19/20. Data from the national Monitoring the Future study were collected one or two years after high school from 2004–2014 (n=2004). Logistic regression was used to examine associations between beverage-specific 5+ drinking and gender, race/ethnicity, parent education, college status, and cohort year. Overall 5+ drinking in the past two weeks was reported by 31.4% of young adults. Beverage-specific 5+ drinking was most common with liquor (22.6%) and beer (22.4%), followed by wine (4.5%) and wine coolers (3.0%). Men were more likely than women to engage in 5+ drinking with beer and liquor; women were more likely than men to do so with wine and wine coolers. Beverage-specific patterns differed by college attendance. Compared to four-year college students, two-year college/votech students were less likely to have 5+ drinks of liquor or wine, and more likely to have 5+ wine coolers; those not in college were less likely to have 5+ drinks of liquor and more likely to 5+ wine coolers. Differences in beverage-specific 5+ drinking by gender and college enrollment suggest that intervention efforts should focus on the beverages that are most commonly consumed at high levels within specific early young adult populations.

*Corresponding Author. Megan E. Patrick, Ph.D., Institute for Social Research, University of Michigan, 426 Thompson St., Ann Arbor, MI, 48106-1248. Telephone 734-763-7107; Fax 734-936-0043; meganpat@umich.edu.

Statement 3: Conflict of Interest

All authors declare that they have no conflicts of interest.

Statement 1: Role of Funding Sources

Manuscript preparation was funded by support from the National Institute on Alcohol Abuse and Alcoholism (R01 AA023504 to M. Patrick) and data collection was funded by support from the National Institute on Drug Abuse (R01DA001411 and R01DA016575 to L. Johnston). The funders had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

Statement 2: Contributors

Dr. Patrick obtained funding and conceptualized the study focus. Ms. Stern conducted literature searches and statistical analyses, as well as wrote the first draft of the manuscript. Ms. Terry-McElrath assisted with statistical analysis and interpretation. All authors substantively contributed to and have approved the final manuscript.

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Keywords

Young Adult; Binge Drinking; Beverage Type

Large-scale epidemiological studies often define binge drinking as consuming five or more drinks on one occasion (Miech et al., 2015; Center for Behavioral Health Statistics and Quality, 2015; Kann et al., 2014). Binge drinking is widespread among young adults: An estimated 30.5% of 18–20 year olds report consuming five or more drinks on at least one occasion in the past month (Substance Abuse and Mental Health Services Administration, 2013). Young adult binge drinking is also associated with negative consequences for both drinkers and the general public, including auto accidents, fights, and accidental injuries (Hingson et al., 2009). While binge drinking is a clear public health issue, very little research has examined which beverages are consumed at these high levels.

Although beverage-specific binge drinking rates have not been documented among U.S. young adults, a small but growing literature has examined variation in beverage-specific alcohol consumption among adolescents. In terms of overall alcohol consumption, liquor is the most commonly consumed alcoholic beverage among high schoolers, followed by beer, wine, and wine coolers (Siegel et al., 2011). In regard to binge drinking, data that combine responses from youth aged 13–20 report liquor consumption in almost half of binge drinking sessions, as compared to beer consumption on less than one-third of such occasions (Naimi et al., 2014).

Research has demonstrated clear demographic subgroup differences in binge drinking. Binge drinking among young adults is more common in men than women (Substance Abuse and Mental Health Services Administration, 2013; Johnston et al., 2015a). In terms of race and ethnicity, underage Black young adults who attend college are less likely to binge drink overall than underage White and Hispanic young adults who attend college (Wechsler et al., 2000). Parent education has been found to positively associate with young adult binge drinking (measured as consuming 4+ drinks for women and 5+ drinks for men on 12 or more days in the past year) (Patrick et al., 2012). Young adults aged 18–22 who are enrolled full-time in college are more likely to binge drink than peers who are either enrolled part-time or not enrolled in college (Substance Abuse and Mental Health Services Administration, 2013; Johnston et al., 2015a). Historically, the prevalence of binge drinking has shown indications of a recent modest decline among all young adults aged 19–28, as well as among full-time college students aged 19–22 (Johnston et al., 2015a).

Very little research has examined demographic differences in beverage-specific binge drinking; available studies have been limited to adolescents. Among high school seniors, boys are more likely than girls to binge drink beer and liquor, whereas girls are more likely than boys to binge drink wine coolers and wine (Johnston et al., 2015b). This pattern also holds for general beverage-specific drinking trends, as beer is more commonly consumed by male high school students than female students, whereas other forms of malt beverages (i.e., hard lemonade) are more commonly consumed by female than male high-school students (Centers for Disease Control and Prevention, 2007). Differences in adolescent beverage-specific binge drinking by race/ethnicity have also been noted. In general, White 12th

graders had the highest prevalence of consuming beer, liquor, wine, and wine coolers at binge levels, followed by Hispanic and then Black 12th graders (Johnston et al., 2015b). One exception to this pattern was regarding wine coolers, for which Hispanic high school seniors had the lowest likelihood of consuming at binge levels (Johnston et al., 2015b). The prevalence of binge drinking beer and liquor among high school seniors has decreased in recent years, whereas the prevalence of binge drinking wine and wine coolers has increased (Johnston et al., 2015b). The extent to which the demographic and cohort patterns observed for adolescent beverage-specific binge drinking may extend into young adulthood is unknown. Furthermore, the extent to which young adult beverage-specific binge drinking may vary based on college status has not previously been examined.

The Current Study

Knowing which beverages are most often consumed in high quantities among young adults has implications for policy and intervention efforts, which may be enhanced by focusing on the beverages that are most commonly consumed at high levels. The current study aims to describe the prevalence of consuming 5+ drinks in a row in the past two weeks of four specific beverages (beer, liquor, wine, and wine coolers) among U.S. young adults aged 19 and 20, as well as demographic and cohort differences in observed prevalence.

Three research questions guided analyses: (1) What is the prevalence of past two-week 5+ drinking for all alcohol, and for beverage-specific 5+ drinking of beer, liquor, wine, and wine coolers? (2) How do rates of beverage-specific 5+ drinking vary based on key demographics (gender, race/ethnicity, parental education, college status, and cohort)?

METHODS

Sample

Data from the national cohort-sequential Monitoring the Future (MTF) study (Johnston et al., 2015a) were used for this analysis. Since 1975, data have been collected from annual nationally-representative samples of approximately 15,000 high school seniors (modal age 18) from about 130 schools. The survey is usually completed during a typical high school class period. From each annual sample of 12th grade respondents, about 2,400 students are selected for longitudinal follow-up (substance users are over-sampled; analyses include weights to adjust for this oversampling). Half of the subsample is randomly selected for follow-up survey participation one year after high school (at modal age 19) and the other half is surveyed two years after high school (at modal age 20). Follow-up surveys are completed in the spring and are accompanied by a modest monetary incentive.

To examine the current rates of beverage-specific 5+ drinking among early young adults, this analysis is limited to the most recent decade of data available, collected from 2004 through 2014 at modal ages 19/20. Respondents include those from the 12th grade cohorts of 2002 through 2012.¹ The alcohol use outcomes for these analyses were included on only one of

¹Given that analyses are limited to data collected during 2004–2014, respondents at modal age 19 from the 2002 cohort are excluded, as their responses were collected in 2003.

the six randomly distributed MTF questionnaire forms. Of those who responded to the relevant form in 12th grade, 4,245 individuals were selected for the longitudinal study, of whom 2,131 participated at modal age 19 or 20 (50.2% response rate; attrition weights were used to adjust non-response by base year respondents). An additional 127 respondents were excluded due to contradictory responses (i.e., reporting beverage-specific 5+ drinking but no overall 5+ drinking during the same period), leaving 2,004 respondents for analysis. The final analytic sample was 56.3% female and 43.7% male, and 71.2% White, 8.1% Black, 10.5% Hispanic, and 10.1% Asian/Other/missing on race.

Measures

Alcohol use (modal age 19/20)—Five alcohol use behaviors were examined in these analyses. All measures used the same basic question format and response scale: “Think back over the last two weeks. How many times have you had five or more [*specified beverage drinks*] in a row?” Response options included “none,” “once,” “twice,” “three to five times,” “six to nine times,” and “ten or more times.” Dichotomous indicators of one or more times (1) versus none (0) were coded for analysis. The five specified beverage/quantity behaviors were:

- a. Overall 5+ drinking: “...five or more drinks in a row? (A ‘drink’ is a bottle of beer, a glass of wine, a wine cooler, a short glass of liquor, or a mixed drink).”
- b. Beer 5+ drinking: “...five or more 12-ounce cans of beer (or the equivalent) in a row?”
- c. Liquor 5+ drinking: “...five or more mixed drinks or shot glasses of hard liquor in a row?”
- d. Wine 5+ drinking: “...five or more 4-ounce glasses of wine in a row (or the equivalent, which is about three-fourths of a bottle)?”
- e. Wine cooler 5+ drinking: “...five or more 12-ounce bottles of wine cooler (or the equivalent) in a row?”

Demographics (modal age 18)—Gender was coded as female (reference) or male. Race/ethnicity was self-identified and coded as White (reference), Black, or Hispanic. Due to small sample sizes, respondents reporting other race/ethnicities could not be examined separately. Parent education indicated whether no parent had a college degree (reference) or at least one parent earned a college degree. Cohort indicated the year of the respondent’s 12th grade survey and was coded into a trichotomy identifying the cohort year as follows: 2002–2005 (reference), 2006–2009, and 2010–2012.

College status (modal age 19/20)—Respondents were asked a series of questions about their current academic involvement. Based on their responses, a three-category measure was coded: a) currently attending a 4-year college (reference), b) currently attending either a 2-year college or technical/vocational school (hereafter referred to as votech), or c) neither of the above (referred to as “no college”).

Data Analysis

SAS version 9.4 was used for analysis. All analyses were weighted using attrition weights, calculated as the inverse probability of participation at age 19/20 based on gender, race/ethnicity, college plans, high school grades, number of parents in the home, religiosity, parent education, alcohol use, cigarette use, marijuana use, region, cohort, and the sampling weight accounting for over-sampling of substance users (Terry-McElrath & O'Malley, 2015). Research question 1 (prevalence of overall and beverage-specific 5+ drinking) was evaluated through descriptive statistics. To examine research question 2 (variation of beverage-specific 5+ drinking by key covariates), bivariate and multivariable logistic regressions were run using PROC LOGISTIC with beverage-specific 5+ drinking indicators as the dependent variables. No missing data were present for gender or cohort; missing data on other covariates were identified and modeled using missing data indicators.

RESULTS

Research Question (RQ) 1: Young Adult 5+ Drinking Prevalence at Age 19/20

Prevalence rates for 5+ drinking are presented in Table 1. Any overall 5+ drinking in the past two weeks was reported by 31.4% of young adults. Beverage-specific 5+ drinking among all 19/20-year-old respondents was most common for liquor (22.6%) and beer (22.4%), followed by wine (4.5%) and wine coolers (3.0%). Among respondents who reported overall 5+ drinking and provided sufficient data to examine any beverage-specific 5+ drinking, the overwhelming majority (89.8%) reported at least one form of beverage-specific 5+ drinking. Of those who reported any beverage-specific 5+ drinking, 41.4% reported only one type of beverage-specific 5+ drinking, 44.8% reported two types of beverage-specific 5+ drinking, and 13.8% reported three or four types of beverage-specific 5+ drinking.

RQ 2: Demographic Associations with Young Adult 5+ Drinking

Weighted percentages of each respondent demographic subgroup reporting overall and beverage-specific 5+ drinking are shown in Table 2. Within virtually all demographic subgroups, prevalence rates for both beer and liquor 5+ drinking were notably higher than those for wine or wine cooler 5+ drinking. There was one exception to this general pattern: among Black respondents, 12.2% reported liquor 5+ drinking, while prevalence rates for the three remaining beverages were lower (ranging from 2.9% for wine cooler 5+ drinking to 5.7% for beer 5+ drinking). Results of bivariate and multivariable logistic regression models estimating the odds of 5+ drinking by key covariates are reported in Tables 3–4.

Gender—In both the bivariate and multivariable models, men were significantly more likely to report any overall 5+ drinking than women. Men were also significantly more likely to have 5+ drinks of beer and liquor than women, whereas women were significantly more likely to have 5+ drinks of wine coolers and wine than men.

Race/ethnicity—White young adults were more likely to have 5+ drinks overall and have 5+ drinks of beer and liquor than their Black and Hispanic peers (significant in both bivariate and multivariable models). In bivariate models, White young adults had greater odds of 5+ drinking wine than Hispanic young adults; this association was not significant in

multivariable models. No significant differences between White and Black young adults were observed in the odds of having 5+ drinks of wine. No significant race differences were detected in the odds of having 5+ wine coolers.

Parent education—Respondents with at least one parent with a college degree were significantly more likely to have 5+ drinks overall and have 5+ drinks of beer or liquor in bivariate models, but differences were not significant in multivariable models.

College status—Compared to four-year college students, two-year college/votech students were significantly less likely to have 5+ drinks overall or to have 5+ drinks of liquor or wine in both bivariate and multivariable models (two-year college/votech students were also significantly less likely to have 5+ drinks of beer in bivariate but not multivariable models). In contrast, two-year college/votech students were more likely than four-year college students to have 5+ drinks of wine coolers in both bivariate and multivariable models. Respondents not attending college were significantly less likely than four-year college students to have 5+ drinks overall in the bivariate model only, and were not significantly different from four-year college students in their likelihood of having 5+ drinks of beer or wine in either bivariate or multivariable models. Those not in college were less likely than four-year college students to have 5+ drinks of liquor but more likely to have 5+ drinks of wine coolers in both bivariate and multivariable models.

Cohort—No significant changes across cohort groups were observed for overall or beverage-specific 5+ drinking.

DISCUSSION

The growing U.S. literature on adolescent beverage-specific binge drinking had previously not been extended into young adulthood. Adolescents do not necessarily mimic adult drinking preferences, and the literature has called for additional research on drinking habits among youth specifically (Siegel et al., 2015). Therefore, the current study examined which types of beverages are most often consumed at high levels (defined as 5+ drinks in the past two weeks) by early young adults in the U.S.

Overall 5+ drinking was reported by 31.4% of respondents in this sample of 19/20-year-old U.S. young adults. Liquor and beer were the most common specific beverages consumed at 5+ levels (22.6% and 22.4% of young adults, respectively), a finding that is consistent with prior research on overall binge drinking and beverage-specific binge drinking in other populations (Johnston et al., 2015b; Siegel et al., 2011; Naimi et al., 2014). A preference towards drinking liquor or beer is associated with an increased likelihood of 5+ drinking. Wechsler et al. (2000) found that underage college drinkers who report wine as their drink of choice are less likely to binge drink than respondents who prefer beer, liquor, or have no preference. Increased exposure to alcohol advertising in young adulthood is correlated with increased drinking intensity (Anderson et al., 2009). The substantial amount of alcohol industry advertising for liquor and beer to underage audiences (Center on Alcohol Marketing and Youth, 2010) may contribute to a preference for liquor and beer binge drinking among underage young adults.

Beverage-specific 5+ drinking patterns differed by key covariates and extended prior research about overall binge drinking rates and beverage-specific drinking patterns. Gender and race/ethnicity have been identified as key risk indicators for overall and beverage-specific binge drinking among adolescents (Substance Abuse and Mental Health Services Administration, 2013; Johnston et al., 2015a). The current study's findings supported not only the presence of such associations but also their direction among young adults. In the current study of young adults aged 19/20, men were more likely than women to have 5+ drinks overall, and to have 5+ drinks of beer and liquor, whereas women were more likely than men to have 5+ drinks of wine and wine coolers. This result corroborates existing findings that binge drinking is more common among men over age 15 than women (World Health Organization, 2014) and that adolescent boys are more likely than girls to usually drink liquor and beer whereas girls are more likely than boys to usually drink wine coolers (Siegel et al., 2011). In terms of race/ethnicity, the current study demonstrated that White young adults were more likely to have 5+ drinks overall and to consume beer and liquor at 5+ levels than their Black and Hispanic peers. This extends previous findings that White high school students more commonly consume alcohol at binge levels than Black or Hispanic students (Miller et al., 2007). Overall, previous drinking patterns observed by gender and race/ethnicity among adolescents and adults seem to hold for early young adults. Thus, the gender and racial/ethnic groups at risk for beverage-specific heavy drinking appear to be somewhat stable during the transition to early adulthood.

With regards to parent education, our research indicates that this covariate may not be as strong of a predictor among early young adults as it is for adolescents. Patrick et al. (2013) found that high school seniors who have parents with some college education are more likely to binge drink than high school seniors with parents who did not attend college. Our findings revealed that among 19/20 year olds, parent education continued to be a significant bivariate predictor for 5+ drinking overall and beer and liquor 5+ drinking. However, parent education was not a significant predictor in the multivariable models. Additional analyses (not shown) revealed that significance dropped when controlling for either race/ethnicity or college status. Research with other young adult samples (Patrick et al., 2012) indicated that parent education at the postgraduate level was associated with significantly increased binge drinking prevalence in a multivariable context. Although the current study did not explore various levels of parent college education associations (e.g., undergraduate vs. postgraduate education) with 5+ drinking, results may indicate that as adolescents transition into young adulthood, the impact of socioeconomic status of their family of origin (with parent education serving as a proxy) on 5+ drinking behavior may lessen or may be mediated by other factors.

Our results support and expand on research identifying an association between college attendance and heavy drinking (Gfroerer et al., 1997; O'Malley & Johnston, 2002; White et al., 2006; Johnston et al., 2015a). Previous research has compared young adults enrolled in college to unenrolled young adults (and to a more limited extent, full-time college students versus other young adults). The current study further separated four-year college students from two-year college and votech students. Four-year college students were more likely to have 5+ drinks of liquor than either two-year/votech students or students not attending college. Thus, four-year college students were most at risk for liquor 5+ drinking at age

19/20. However, four-year college students were less likely to consume wine coolers at 5+ levels than either two-year/votech students or students not attending college, indicating that the types of beverages consumed during heavy drinking occasions differ by college enrollment.

Prior research has indicated that overall binge drinking has decreased over historical time at age 18 (Miech et al., 2015; Patrick et al., 2013) and ages 19–22, especially for non-college attenders (Johnston et al., 2015a). The current study did not find a significant decrease in overall or beverage-specific 5+ drinking among young adults aged 19/20 in the past decade. By the time adolescents reach early young adulthood, it does not appear that the decreasing trend in heavy drinking at age 18 has continued.

Limitations and Future Directions

This study should be evaluated in light of its limitations. First, high school dropouts are not included in the sample; findings may not generalize to individuals who drop out of high school prior to their senior year. Second, the heavy drinking measure used (5+ drinks) was the same for both men and women, although the current NIAAA definition of binge drinking is 4+ drinks for women to compensate for body size and alcohol metabolism differences (National Institute on Alcohol Abuse and Alcoholism, n.d.). Lastly, the combinations of beverages consumed during 5+ drinking occasions were not reported; only drinking occasions that included 5+ drinks of the same beverage were examined as beverage-specific 5+ drinking. Despite these limitations, this is the first U.S. study to examine beverage-specific 5+ drinking among young adults and provides data from a large, multi-cohort sample. Results indicate that liquor and beer 5+ drinking were more common than wine and wine cooler 5+ drinking; efforts to reduce heavy drinking may be enhanced by targeting these two beverage types specifically. Future research should also examine the different beverages that constitute multi-beverage binge drinking episodes.

Acknowledgments

Manuscript preparation was funded by support from the National Institute on Alcohol Abuse and Alcoholism (R01 AA023504 to M. Patrick) and data collection was funded by support from the National Institute on Drug Abuse (R01DA001411 and R01DA016575 to L. Johnston). The content here is solely the responsibility of the authors and does not necessarily represent the official views of the sponsors. The authors declare no conflict of interest.

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Highlights

- We examined beverage-specific 5+ drinking among U. S. young adults.
- 5+ drinks was most common with liquor and beer, followed by wine and wine coolers.
- Men were more likely than women to have 5+ drinks of beer and liquor.
- Women were more likely than men to have 5+ drinks of wine and wine coolers.
- 5+ drinking differed by college enrollment (4-year, 2-year/votech, no college).

Table 1

Descriptive Statistics

	%	SD
<u>Alcohol Use Outcomes (modal age 19/20)</u>		
Overall 5+ drinking	31.4	0.464
Beer 5+ drinking	22.4	0.417
Liquor 5+ drinking	22.6	0.418
Wine 5+ drinking	4.5	0.207
Wine cooler 5+ drinking	3.0	0.171
<u>Demographics (modal age 18)</u>		
Male	49.5	0.500
Race/Ethnicity ^a		
White	63.1	0.482
Black	11.6	0.320
Hispanic	14.0	0.347
Other/Missing Indicator	11.3	
Parent Education		
College degree	50.2	0.500
Missing indicator	3.0	
<u>College Status (modal age 19/20)</u>		
Four-year college	44.8	0.497
Two-year college/votech	25.5	0.436
No college	29.0	0.454
Missing indicator	0.6	
<u>Cohort Year (modal age 18)</u>		
2002 – 2005	32.1	0.467
2006 – 2009	39.5	0.489
2010 – 2012	28.5	0.451

Notes: Total unweighted $N = 2,004$. For specific outcomes, unweighted $n = 1,905$ for overall 5+ drinking; 1,942 for beer 5+ drinking; 1,928 for liquor 5+ drinking; 1,957 for wine 5+ drinking; 1,947 for wine cooler 5+ drinking. Standard deviations are not reported for missing indicators.

^aOther race/ethnicities were combined with missing due to small sample sizes.

Table 2

Weighted Percentages of Respondents Reporting Overall or Beverage-Specific 5+ Drinking at Modal Age 19/20 by Key Covariates

	Overall 5+ Drinking %	Beer 5+ Drinking %	Liquor 5+ Drinking %	Wine 5+ Drinking %	Wine Cooler 5+ Drinking %
<i>Unweighted n</i>	1,905	1,942	1,928	1,957	1,947
Gender					
Female	27.0	14.6	20.5	5.3	4.2
Male	35.9	30.6	24.7	3.6	1.7
Race/Ethnicity ^a					
White	37.6	28.5	26.4	5.4	3.1
Black	15.8	5.7	12.2	3.6	2.9
Hispanic	20.6	12.5	14.6	2.7	2.0
Parent Education					
Less than college degree	30.1	20.9	20.7	3.8	3.0
College degree	33.7	24.5	25.1	5.2	3.1
College Status					
Four-year college student	35.4	24.0	26.5	5.7	1.8
Two-year/votech student	24.7	18.4	17.5	2.5	4.6
No college	30.8	23.0	20.6	4.4	3.4
Cohort					
2002–2005	31.9	23.7	23.9	4.5	2.7
2006–2009	32.8	23.0	22.2	4.9	2.9
2010–2012	28.9	20.3	21.5	3.9	3.5

Notes: Data depict the percentage of cases in each specified covariate category that report the specified outcome. Missing data indicators (percentages not shown) control for missing data on non-outcome measures.

^aOther race/ethnicities were combined with missing due to small sample sizes.

Table 3
Associations between Key Covariates and Overall 5+ Drinking Prevalence at Modal Age 19/20

Overall 5+ Drinking						
	OR ^a	95% CI	p	AOR ^b	95% CI	p
Gender (v. Female)						
Male	1.52	(1.30, 1.77)	<0.001	1.57	(1.34, 1.84)	<0.001
Race/ethnicity (v. White) ^c						
Black	0.31	(0.23, 0.42)	<0.001	0.34	(0.25, 0.46)	<0.001
Hispanic	0.43	(0.33, 0.56)	<0.001	0.47	(0.36, 0.61)	<0.001
Parent Education (v. No degree)						
College degree	1.18	(1.01, 1.38)	0.035	0.99	(0.84, 1.17)	0.895
College Status (v. Four-year student)						
Two-year/votech student	0.60	(0.49, 0.73)	<0.001	0.67	(0.55, 0.82)	<0.001
No college	0.81	(0.68, 0.98)	0.025	0.84	(0.69, 1.02)	0.073
Cohort (v. 2002–2005 cohorts)						
2006–2009	1.04	(0.87, 1.25)	0.650	1.13	(0.94, 1.36)	0.200
2010–2012	0.87	(0.72, 1.06)	0.169	0.96	(0.78, 1.17)	0.675

Notes: Missing data indicators control for missing data on non-outcome measures. Bivariate and adjusted odds ratios for missing data indicators not shown.

^aOR = Bivariate odds ratio.

^bAOR = Adjusted odds ratio obtained from models simultaneously including all listed covariates.

^cOther race/ethnicities were combined with missing due to small sample sizes.

Table 4

Associations between Key Covariates and Beverage-Specific 5+ Drinking Prevalence at Modal Age 19/20

	Beer 5+ Drinking					Liquor 5+ Drinking						
	OR ^a	95% CI	p	AOR ^b	95% CI	p	OR ^a	95% CI	p	AOR ^b	95% CI	p
Gender (v. Female)												
Male	2.57	(2.16, 3.06)	<0.001	2.64	(2.20, 3.16)	<0.001	1.27	(1.08, 1.51)	0.005	1.30	(1.09, 1.54)	0.003
Race/ethnicity (v. White) ^c												
Black	0.15	(0.10, 0.24)	<0.001	0.16	(0.10, 0.25)	<0.001	0.39	(0.28, 0.54)	<0.001	0.42	(0.30, 0.59)	<0.001
Hispanic	0.36	(0.26, 0.48)	<0.001	0.38	(0.28, 0.52)	<0.001	0.47	(0.36, 0.63)	<0.001	0.53	(0.40, 0.71)	<0.001
Parent Education (v. No degree)												
College degree	1.23	(1.04, 1.45)	0.018	1.02	(0.85, 1.23)	0.813	1.28	(1.08, 1.52)	0.005	1.07	(0.90, 1.28)	0.455
College Status (v. Four-year student)												
2-year/votech student	0.72	(0.58, 0.89)	0.002	0.81	(0.64, 1.01)	0.063	0.59	(0.47, 0.73)	<0.001	0.66	(0.52, 0.82)	<0.001
No college	0.95	(0.78, 1.16)	0.600	0.96	(0.78, 1.19)	0.713	0.72	(0.59, 0.88)	0.001	0.76	(0.62, 0.94)	0.010
Cohort (v. 2002–2005)												
2006–2009	0.96	(0.79, 1.17)	0.682	1.05	(0.85, 1.28)	0.664	0.91	(0.75, 1.11)	0.355	0.97	(0.79, 1.18)	0.755
2010–2012	0.82	(0.66, 1.02)	0.072	0.89	(0.71, 1.11)	0.294	0.87	(0.70, 1.08)	0.213	0.94	(0.75, 1.17)	0.551
	Wine 5+ Drinking					Wine Cooler 5+ Drinking						
	OR ^a	95% CI	p	AOR ^b	95% CI	p	OR ^a	95% CI	p	AOR ^b	95% CI	p
Gender (v. Female)												
Male	0.67	(0.48, 0.95)	0.023	0.68	(0.48, 0.96)	0.027	0.40	(0.25, 0.62)	<0.001	0.37	(0.24, 0.59)	<0.001
Race/ethnicity (v. White) ^c												
Black	0.65	(0.37, 1.16)	0.148	0.72	(0.40, 1.28)	0.261	0.91	(0.47, 1.76)	0.786	0.90	(0.46, 1.76)	0.759
Hispanic	0.49	(0.27, 0.89)	0.020	0.56	(0.30, 1.03)	0.062	0.65	(0.32, 1.30)	0.221	0.58	(0.28, 1.19)	0.136
Parent Education (v. No degree)												
College degree	1.39	(0.98, 1.95)	0.062	1.23	(0.86, 1.76)	0.266	1.02	(0.68, 1.53)	0.936	1.20	(0.78, 1.85)	0.399
College Status (v. Four-year student)												
2-year/votech student	0.42	(0.26, 0.69)	0.001	0.47	(0.29, 0.78)	0.003	2.72	(1.63, 4.53)	<0.001	3.11	(1.84, 5.25)	<0.001
No college	0.75	v	0.149	0.85	(0.57, 1.27)	0.424	1.99	(1.17, 3.38)	0.011	2.38	(1.38, 4.12)	0.002

	Wine 5+ Drinking					Wine Cooler 5+ Drinking						
	OR ^a	95% CI	p	AOR ^b	95% CI	p	OR ^a	95% CI	p	AOR ^b	95% CI	p
Cohort (v. 2002–2005 cohorts)												
2006–2009	1.10	(0.75, 1.63)	0.630	1.17	(0.79, 1.73)	0.439	1.08	(0.65, 1.77)	0.778	1.10	(0.67, 1.83)	0.705
2010–2012	0.86	(0.55, 1.35)	0.522	0.93	(0.59, 1.46)	0.755	1.29	(0.77, 2.17)	0.336	1.37	(0.81, 2.32)	0.238

Notes: Missing data indicators control for missing data on non-outcome measures. Bivariate and adjusted odds ratios for missing data indicators not shown.

^aOR = Bivariate odds ratio.

^bAOR = Adjusted odds ratio obtained from models simultaneously including all listed covariates.

^cOther race/ethnicities were combined with missing due to small sample sizes.